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NAVY CIVIL ENGINEER

FALL EDITION 1972

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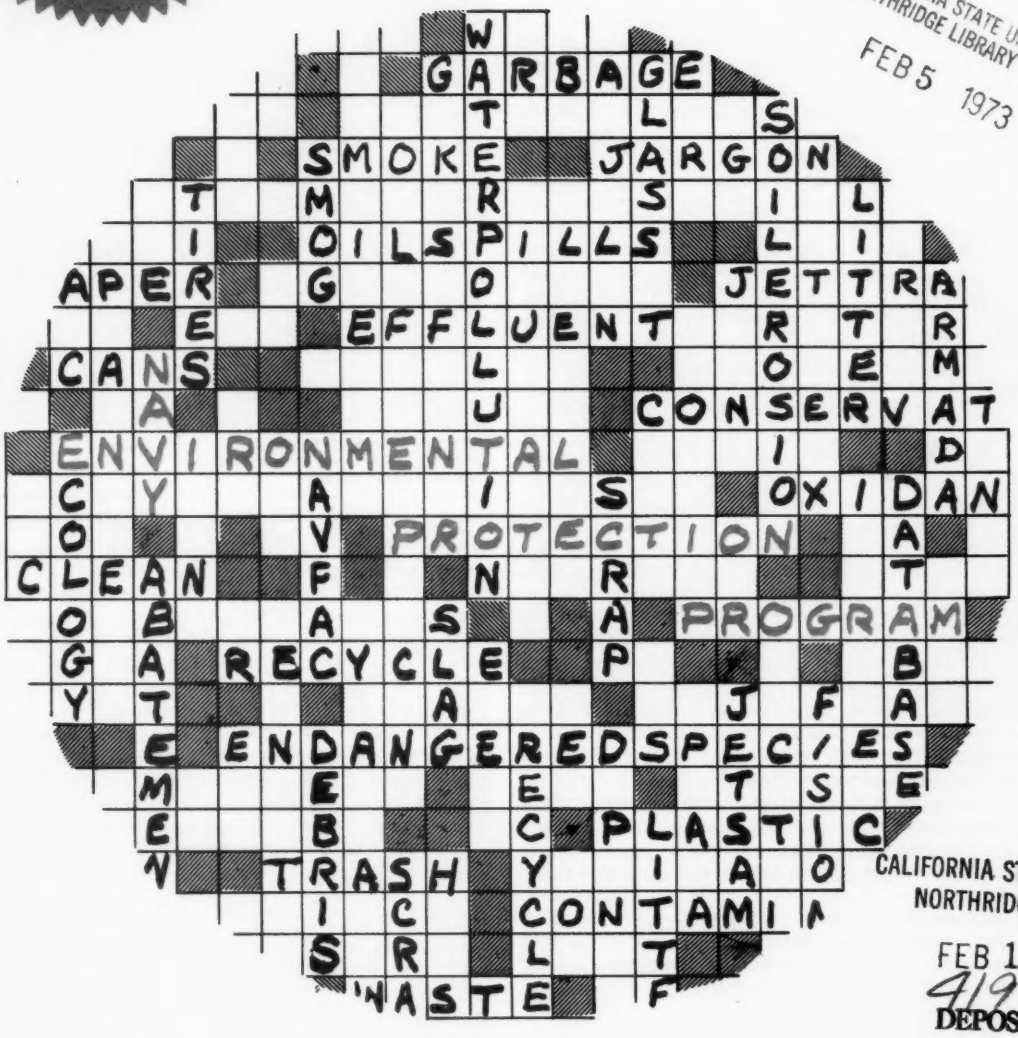

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NAVY SOLUTIONS FOR SOME PROBLEMS OF POLLUTION . . .

See Inside

POLLUTION . . .

everyone's problem

By LCDR ALLEN J. STEWART, CEC, USN

Ah yes, America the beautiful. It has always been so . . . a romantic, young, robust land with opportunities for any and all who seek them. From sea to shining sea it lies, a golden land of verdant valleys and snow-tipped mountains where here and there farms and communities dot the horizon. This wonderful expanse is inhabited by an ever-growing number of people who are proud to call this "our land." Yet as our population increases, so the problems attendant to our society manifest themselves . . . the more sophisticated our lives become, the greater are the unwanted residues scattered by our affluent society. America the Beautiful is rapidly becoming cluttered and covered with millions of tons of what ecologists call solid wastes.

What a few short years ago seemed to be a bothersome collection of trash in city dumps unobtrusively hidden somewhere at the edge of town, has become a problem of concern to us all. "Environmental pollution" is now a household word . . . and little wonder! Every day, each one of us discards approximately 5½ pounds of waste. Collectively, this adds up to a staggering total of over 400 billion pounds annually! In a single year, we in the United States toss away 55 billion cans, 26 billion bottles, 60 billion bottle caps, 30 million tons of paper. Americans also, unbelievably, annually junk 7 million automobiles and 100 million tires. Think of it! This is enough trash to fill the Panama Canal four times over, and this amount is predicted to increase threefold in ten years.

These figures are more meaningful when converted into dollar amounts. Experts estimate that the country's trash bill totals $4.5 billion a year, a sum for public services that is exceeded only by schools and roads. The whole business of dirtying one area to clean another is what is generally meant by "abatement" of pollution. The kind of action we usually take to "get rid of pollution" adds up to "abatement", and it is too often nothing more than passing the buck.

Complicating the problem further, many of today's newer products don't deteriorate quickly or at all. The tin can rusts away. Now we have the immortal aluminum can which will outlast us all. Non-returnable bottles and plastics are the biggest headaches of all, say sanitary engineers. Plastics completely immune to biological decomposition. If we burn them, they contribute hydrocarbons and oxides of nitrogen (both dangerous air pollutants) to our atmosphere. If we bury them, we add trash-for-posterity to our soil.

On The International Scene

Secretary of State William P. Rogers has said that "the winds and waters of the earth know no political boundaries; they carry pollutants indiscriminately to all nations. The degradation of the human environment is a worldwide problem, requiring joint action by the international community." Thor Heyerdahl, the renowned scientist and explorer, testifying before a Senate subcommittee on pollution, stated that when he made his voyage on the Kon Tiki two decades ago, the ocean was perfectly clear. But he said that when he recently retraced that voyage there was no place, not even in the vast middle area of the sea, where he did not see signs of pollution. Oil spills from torn carcases of ever-larger behemoth tankers spread crude oil on the whitest of the earth's beaches, turning the sand into a sticky, black trap for sea birds and marine life.

Having waste ground enough,
Shall we desire to race the sanctuary
and pitch our evils there?

—Shakespeare, Macbeth

The United States has taken the lead in developing a common attack on worldwide environmental problems. In response to President Nixon's recent proposal to the North Atlantic Treaty Organization that it recognize international pollution problems, NATO established a "Committee on the Challenges of Modern Society." It will initiate and coordinate efforts of member countries to purify the water and air, better plan their land use, eliminate malefic pesticides and contend with a myriad of other environmental ills.

Also, in concert with Canada, we have developed a plan of attack to reduce the ever-increasing pollution of the Great Lakes. We have a flood control project — jointly with Mexico — for the lower Rio Grande Valley, and are currently negotiating an agreement to control salinity in the lower Colorado River, a source of irrigation water for 300,000 acres in the Mexicali Valley.

Multi-Nation Efforts

In all large metropolitan areas an inordinate amount of lead, oxides and other contaminants from automobile exhausts provide a common problem of air pollution. The United States is taking the lead in developing a "clean" engine . . . one which would provide virtually pollution-free automotive power, while Germany and Turkey are working with us in studies leading, hopefully, toward international standards for air pollution control. And we are collaborating with the French Government in the ecological planning of an entirely new pollution-free city to be built in northwest France . . . one that will provide invaluable experience for everyone.

Large industrial countries are not the only ones to feel the impact of pollution problems. Too rapid urbanization, lack of satisfactory disposal facilities to cope with by-products of new factories, soil erosion, water contamination and unplanned growth of building structures and rapid-transit systems are all examples of the ills that plague the emerging nation.

Pollution problems of both developed and developing nations were discussed for the first time on a broad scale when a

United Nations Conference of the Human Environment was held in June at Stockholm, Sweden. Included in a comprehensive agenda was a suggestion calling for an international warning system to monitor ecological changes through the use of earth satellites, computers, and "sentinel" plants and animals which are extremely sensitive to changes in the environment.

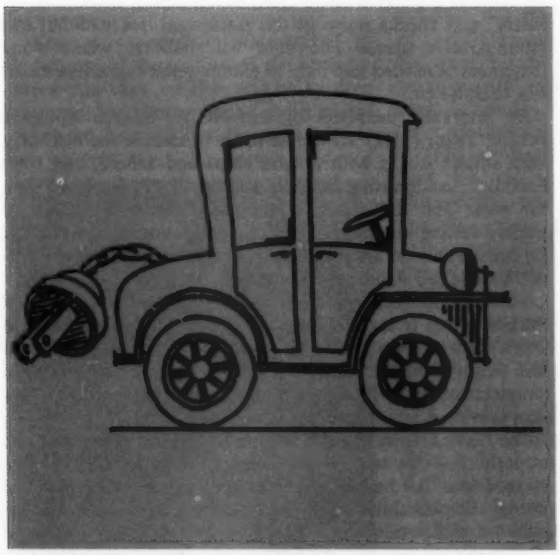
In support of this program, the National Aeronautics and Space Administration will shortly put into orbit a remote-sensing satellite with sophisticated infrared heat detection equipment, as a first step toward gathering complex data in support of an inventory of the world's resources. More than 20 countries have already submitted over 200 projects for this satellite, ranging from forestry to demography.

Navy Efforts

Former Secretary of the Navy John Chafee promised that the navy will "meet or beat every requirement and deadline that has has been established to protect and preserve the environment." Throughout the navy, quantum steps are being taken to halt and reverse the spread of pollution. To continue its environmental protection program, the navy requested $140 million to stem pollution in this fiscal year. The request included $100 million for water pollution problems and $40 million for air pollution.

Another aspect of the navy's environmental program was highlighted in an ALNAV message in support of National Wildlife Week (March 18-25). The message promulgated Secretary Chafee's policy that all suitable areas on navy installations "be fully developed to provide a habitat which will support maximum populations of fish and wildlife compatible with our military mission." The message mentioned also that over two million acres of land and water are under navy and marine corps conservation management. Research is being conducted to find new ways to combat ecological problems. One such activity, the Naval Civil Engineering Laboratory at Port Hueneme, Calif., is developing better ways to deal with oil spillages.

The navy is taking special care to see that damage is not done to existing natural areas. The Atlantic Fleet Amphibious Force recently conducted a cold weather training exercise at Reid State Park in Maine. Initially, the exercise had been opposed by environmentalists; they feared it might damage the park. But a thorough inspection of the park after the exercise showed that as a result of the care taken by the navy, and the clean-up conducted at the end of the exercise, the park was in better condition after the exercise than it had been before.

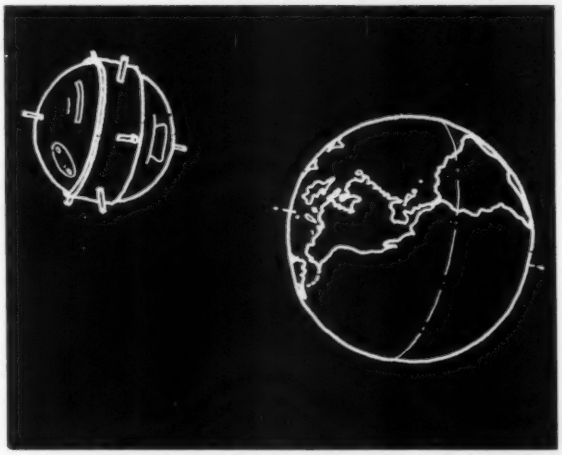


Automobiles 20 years from now probably will not be electric vehicles but rather will have different types of combustion engines from today's piston engines. They will incorporate pollution control design to reduce the amount of toxin emission.

Tideland Fill at Pearl Harbor

The navy's public works center, Pearl Harbor, is involved in a vast refuse collection and disposal program on the island of Oahu, Hawaii. In that complex, approximately 3,680 navy family housing units generate 76,000 cubic yards of garbage annually. In addition, 1,365,000 cubic yards of refuse from industrial and waterfront locations are collected and disposed of at a cost of over a half million dollars a year.

Most of the refuse in Hawaii is disposed of by burning or by sanitary cut and fill operations. However, a paucity of land on Oahu, which encompasses only 589 square miles, has brought sharp criticism of these activities from civic leaders, elected officials and conservationists. In contrast to this, the navy's public works center has for some time been reclaiming low tidal land on the Pearl City Peninsula by a systematic process of refuse fill with inorganic cover. This procedure, together with maintenance dredging operations, has added several dozens of buildable acres to Hawaii's shoreline on which navy family housing units are planned for future construction. This is but one outstanding example of the navy's role in the solution of urban problems.



Earth orbiting satellites will provide technical data in support of international ecological control programs.

At all levels, the navy has shown a keen desire to do its part and more in working toward a better, pollution-free community. There are many innovative ways in which we may all share in this responsibility. Lieutenant (jg) Donald R. Marsh, CEC, USN, the Environmental Protection Officer at the Construction Battalion Center, Davisville, Rhode Island, was awarded the Navy Commendation Medal this past December by Navy Secretary John Chafee for his work in developing a recycling facility at the Seabee Center. This method of reusing refuse material will effectively save the government money while reducing the volume of solid waste.

"We need lumber to build our homes — but we also need untouched forests to refresh our spirits. We need rivers for commerce and trade — but we also need clean rivers to fish and sit by. We need land for homes and for great industrial plants, but we also need land free from man's works." These words of President Nixon have been echoed by business, industry and the Department of the Navy. We are as concerned with cleaning up the environment as everyone else . . . and we are doing something about it.

PEARL HARBOR ATTACK ON POLLUTION

(Above) Water sampling team lowers a colored disk into the harbor for visual observation of water clarity.

(Left) Biologist Jeff Grovhoug examines specimens of sea life collected from the waters of Pearl Harbor for long term biological studies of the effects of pollution abatement efforts.

(Below) Homer Lassiter, physicist, sets up a microphone and recording equipment for sampling the level of community noise, including autos, industry, recreation and residential sounds.

•Pearl Harbor, Hawaii

Pearl Harbor, scene of the infamous attack in 1941, is witnessing a different kind of war in 1972. In this busy island port, the U.S. Navy is going all out to defeat the forces of pollution . . . in the air, on the land and in the sea.

Some 70,000 people live and work at the Pearl Harbor Naval Base. These people, along with their machines, ships, planes and various industrial processes, create pollutants of many kinds.

In the past, much of this waste material found its way into the harbor, and water pollution became a problem. Then the navy initiated an energetic and broad-ranging program to tidy up its own backyard. Pearl Harbor is now getting a thorough housecleaning.

The attack is being led by a group of experts from the Naval Civil Engineering Laboratory (NCEL) at Port Hueneme, California. In 1971, NCEL was named Deputy Program Manager of the Navy's Environmental Protection Data Base, a program to determine the extent of Navy-originated pollution problems and to compile data that will provide a basis for correcting it. Pearl Harbor was a primary target.

The NCEL environmental group selected nearly 120 water and biological sampling stations in different parts of the harbor. Each working day, water samples are taken from the surface and from the bottom at points along the chain of stations. The samples are checked on the spot for salinity, temperature, dissolved oxygen content and acid-base content, then sent to the laboratory for further testing. The laboratory checks the bacteriological count and analyzes the metal, carbon, phosphates and other particulates. The information is fed into computers to produce a continuing record of the water condition as anti-pollution efforts proceed.

In addition, a team of biologists takes regular samplings of the flora and fauna of the harbor. Specimens are studied in the laboratory, and again the results are recorded. These studies will establish both the condition and the variety of the harbor's undersea life over an extended period of time.

But the NCEL group is interested in other forms of pollution too. An expert on noise visits different parts of the base in a navy station wagon equipped with a noise monitoring system. He records the sound levels from automobiles, trucks and industry, and checks noise in the residential, recreational and administrative areas. The data will indicate where noise abatement is needed and help in planning the corrective measures to be taken.

At intervals, members of the NCEL Source Emission Testing Team (SET) are called upon to sample the discharge from smoke stacks both aboard ships and ashore, and from shredders, sandblasting facilities and the like in the Pearl Harbor area. The SET team is equipped with a full range of modern testing equipment, and can determine whether or not the emissions meet air pollution regulations. Meeting or bettering the required standards is the navy's aim.

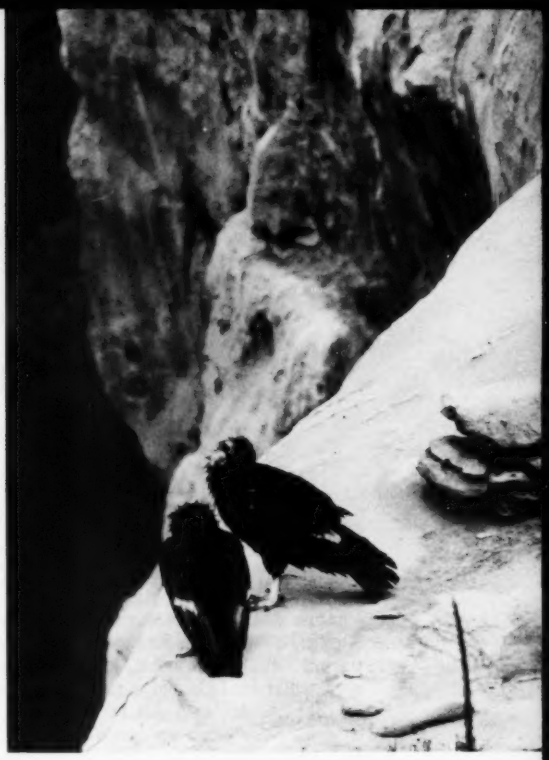
Streams are notorious carriers of pollution, and the Pearl Harbor group is investigating the waters of local creeks and rivers. This involves collecting samples of the water over a 24 hour period. The samples are then taken to the laboratory for a complete analysis. Here again, the results of the laboratory tests provide a data base for future action.

The Navy is spending $15 million on a system to collect and properly treat raw sewage and industrial wastewaters to be discharged into the harbor. Definite progress is being made in solving the pollution ills of Pearl Harbor. Both noise and air pollution will be controlled, based on the valuable background of information provided by the NCEL environmental protection group. The Pearl Harbor project is an example of what can be accomplished by a well planned, scientific approach to pollution abatement.

THE NAVY PROTECTS ENDANGERED SPECIES

By JACKSON H. JOJOKIAN

Natural Resources Management Trainee
Naval Facilities Engineering Command



California Condor couple survey their vast preserve in Los Padres National Forest, last refuge of their species.

• Washington, D.C.

The Naval Facilities Engineering Command has been designated by the Department of Defense to represent the Defense Department in working with the Department of the Interior and the Department of Agriculture in a program to preserve and restore species of life forms which are faced with extinction. The Endangered Species Conservation Act of 1969 (83 Statute 275) recognizes that the Navy Department, as one of the important Federal land and water managing agencies, has an important contribution to make toward the conservation of native species of endangered fish and wildlife. Accordingly, the Department of the Navy acknowledges its responsibility to maintain environmental quality on the lands and waters under its control.

Species of wildlife often serve as indicators of the quality of the environment that they inhabit, and as is often the case, the quality of the environment inhabited by wildlife reflects, if only in an indirect way, the impact that the environment will have on man. Consequently, the Navy is cooperating fully with the U.S. Forest Service in its request to help preserve the nesting areas of the condor and brown pelican by eliminating overflights by Navy aircraft over the birds' nesting areas on national forest lands along the coastal range of California. "Sonic booms" from overflying planes would naturally disturb the nesting condors, and the results of the disturbance are exaggerated when one considers the physical status of the bird.

Brown Pelicans on Anacapa Island, of California's coast, will nest in serenity insofar as Navy is able to assure it.

The condor, largest land bird in existence on the North American continent, is representative of how wildlife is affected by the environment. The eggs laid by the female condor are surrounded by abnormally thin shells, and research has shown this to be a result of the DDT assimilated from the food fed upon by the parent. Thus, the natural startle response of a disturbed nesting condor will alone be sufficient to crack the extremely thin eggshell.

This problem is compounded by the fact that another bird, the brown pelican, nearly extinct in the state of Louisiana, now exists only in limited numbers along the California coast. Consequently, the Navy Department has agreed to cooperate fully with the request of the U.S. Forest Service for the regulation of Navy activities to assist in the preservation of the condor and brown pelican.

A wildlife population reduced to a very low point can still recover rapidly if its habitat remains unimpaired. But if the habitat is reduced, the species is reduced with it. Most North American wildlife is protected from indiscriminate shooting by state and federal laws, by refuges, and by a growing public awareness of its value. Poaching and illegal hunting of protected species are still problems, but the violator risks heavy fines or jail. Social pressures are against the habitual illegal shooter rather than with him as they often were 50 years ago. Yet, today in North America the direct killing of wildlife is far less serious than habitat destruction. The Navy Department now insures that suitable wildlife habitats will be maintained, wherever possible, on all Navy lands.

Additionally, the problems of thermal pollution on life forms are acknowledged, and the Navy Department is directing surveys toward assessment of the probable gains and losses which might occur from thermal release into the natural system. Considerations that have been suggested for study as possible remedies to the thermal pollution problem are: paying a penalty in generating efficiency by operating with less coolant volume; discharging the heat far out at sea; channeling the warmer water to cooling towers that discharge heat into the atmosphere; cooling and recycling water; or, finally, utilizing the warmed water as a source of heat for buildings. It has been projected that by the mid-1980s, the thermal problem should be moderated by the introduction of other kinds of reactors, notably breeder reactors. Breeders can operate with high-temperature fuel elements. The result is higher thermal efficiency and less discharge of waste heat.

In concluding, it is to be noted that the Department of the Navy is cooperating fully with Government legislation on behalf of ecological orderliness.

Navy Restores Penguins' Rookery In Antarctica

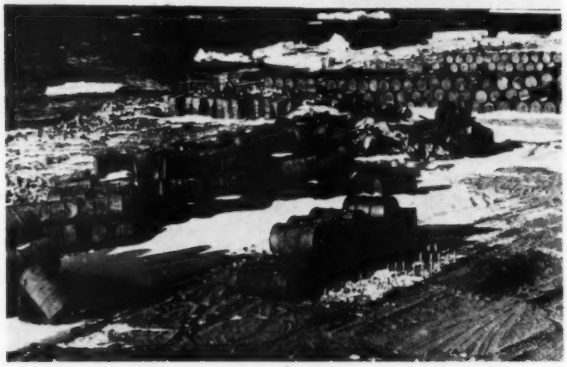
• Hallett Station, Antarctica

A massive effort to preserve the ecology at the United States and New Zealand Hallett Station in Antarctica has returned the area to its natural state. The station, located on the Victorialand Coast of Antarctica at the foot of the majestic Admiralty Mountain Range 350 miles north of McMurdo Station, is situated on a flat, low-lying peninsula overlooked by spectacular ice falls and glaciers. It is the annual nesting area, or rookery, for over 100,000 Adelie Penguins. The man in charge of the clean-up operation, CMC Floyd D. Stevenson has led a group of navy men in cleaning up the area for the past two years.

The debris was an accumulation of broken material disposed of over the last 15 years and amounted to nearly 100 tons. Chief Stevenson said, "it included old helicopter and airplane parts, boilers, electrical cable, wire rope, fuel drums, and just everything under the sun. It covered an area that stretched almost two miles."

The project began during Deep Freeze '70 when many men collected material and placed it in empty 55-gallon fuel drums. During Deep Freeze '71 the intensive effort really started. The Navy team first dug out debris then forklifted it to a staging area away from the penguin rookery. Once the material was accumulated, it was disposed of in various ways that least affected the environment.

The 100,000 nesting penguins were undisturbed during the two year project that spanned two austral summer seasons. In fact, special efforts were made to not disturb the birds. Trash in the rookery area was not removed until after the penguins left. The penguins benefited from the operation as it gave them better access to the sea and returns the area to its natural state.



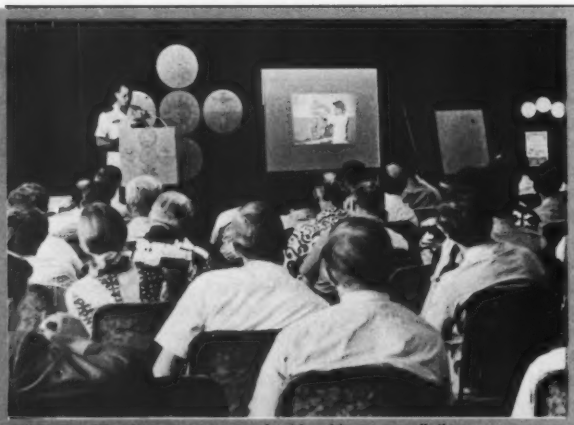
Penguins strut litter free beach near Hallett Station (above, left) after navy personnel cleared litter (above) including over 90 tons of scrap material and 3 thousand 55-gallon steel drums accumulated in their rookery over the past 15 years.

Problems encountered during this operation were (1) equipment breakdown compounded by lack of replacement parts, and (2) trash frozen in the ice and perma-frost, which was very difficult to dig out, especially during the early part of the austral summer.

Chief Stevenson, commenting on the conclusion of the project, said, "all that remains to be accomplished is to dispose of the material in the staging area. This will take about two days when we return during Deep Freeze '73."

In two seasons, Chief Stevenson and five other navy men removed over 90 tons of scrap material from the north and south beach of Hallett Station, and disposed of over three thousand 55-gallon fuel drums.

Antarctica, with all its majestic beauty, will remain so with the aid of men like Chief Stevenson and his crew at Hallett Station.



LCdr. Don Weatherson accompanies his address on pollution abatement at the Naval Supply Depot with slides to illustrate important points and achievements.

ComMarianas Sponsors Environmental Symposium

• Guam, Marianas

The first island-wide environmental symposium, designated "Environmental Awareness 1972" was held May 8, 1972 at the Guam Hilton Hotel. The conference, sponsored by Commander, Naval Forces, Marianas, was highlighted by an address by Governor Carlos G. Camacho.

Cdr. Thomas L. Lonegan, CEC, USN, was chairman and moderator of the event attended by civilian, military and local and federal government personnel.

Gov. Camacho signed a bill expanding the powers of the Guam Air Pollution Control Commission following his address to the conference.

CBC-Davisville Features Community Recycling Program

•Davisville, R.I.

The North Kingstown Ecology Action Committee was formed in April 1971 by Lieutenant (j.g.) Donald R. Marsh, CEC, USN, the assistant planning and facilities engineering officer at the Davisville Seabee Center and also the center's first environmental protection officer.

After several months of planning by Lt. Marsh, the North Kingstown Ecology Action Committee initiated an unusual recycling program on May 8, 1971 at the Seabee Center when the committee began collecting glass bottles. The program was later expanded to include newspapers, magazines and aluminum cans. These materials are received from citizens who live in the general North Kingstown area and military personnel and their dependents. They all deposit the glass, cans and papers at the recycling site located directly outside the main entrance to the Seabee Center.

This site, provided by the commanding officer of the Seabee Center, is believed to be the first of its kind to be operated on any military complex.

Three times a week, volunteers (military dependents and teenagers from the North Kingstown area) man the recycling center and separate the glass by color, remove all metal caps and rings, and crush the glass with sledge hammers, wearing protective safety glasses.

At the recycling center, the volunteers receive glass which is collected, crushed and stored in 55-gallon drums. There are about 50 drums at the recycling center for this purpose. Newspapers are collected and stored in a 38-foot navy trailer. There is a large colorful sign which states "DAVISVILLE RECYCLING CENTER" at the site. This can readily be seen from Post Road, a major highway adjacent to the Seabee Center.

Monthly, the Seabee Center transports these materials to firms which purchase them for re-manufacture into new glass bottles and paper products. The committee received $20 a ton for the glass and about $10 a ton for the paper. The recycling center is currently receiving about 2½ tons of glass and 2 tons of newspaper weekly.

LTJG Donald R. Marsh, originator and driving force of Davisville CBC's recycling program, looks on as former Secretary of the Navy John Chafee takes a pass at breaking some glass. Secretary Chafee presented the Navy Commendation Medal to Marsh for his noteworthy efforts.

After seven months of operation, about 100 tons of glass and 40 tons of newspaper had been collected, for which the committee received more than $2,400. Nearly $1,400 of this was donated to community organizations such as the Boy Scouts, Davisville-Quonset Teen Club and the Ecology Action for Rhode Island committee.

Lt. Marsh also began selling "Earth Notes," a stationery made from 100% recycled waste paper. A box sells for $1 which is cost price. Lt. Marsh does this to promote the use of recycled paper. His motto is: "If you aren't part of the solution, you are part of the pollution."

NAD McALESTER WINS SECOND CONSERVATION AWARD

•McAlester, Okla.

The U.S. Naval Ammunition Depot, McAlester, was named the 1971 winner of the navy's Natural Resources Conservation Award; the second consecutive year it has earned the top conservation designation and the third it has been recognized. In 1969, it was the second place winner.

This year's number two position went to Naval Petroleum Reserve #1 at Tupman, California. The two activities were among 22 navy and marine corps installations nominated for the annual conservation award.

The Chief of Naval Operations commended both for conducting an outstanding conservation program during 1971. The citation accompanying the award read, "The commendable progress and exceptional quality of this command's program to conserve our most basic heritage — our natural resources — reflects the highest credit upon itself and upon the United States Navy."

Throughout the United States, the navy and marine corps have over two million acres of land and water under conservation management, and cooperate with federal and state conservation agencies in the planning, development, maintenance and coordination of fish and wildlife resources on military reservations. RAdm. Walter M. Enger, CEC, USN, commander, Naval Facilities Engineering Command and Chief of Civil Engineers of the Navy, invited a panel of prominent conservationists to judge this years nominees. They selected the award winners while meeting at the command's headquarters in Washington, D.C. on April 19, 1972. NAVFAC has the responsibility for total management of the Navy Department's Natural Resources Conservation Program.

The judges included Dr. Ira N. Gabrielson, Chairman of the Board of Directors of the Wildlife Management Institute; Mr. Lloyd E. Partain, Assistant to the Administrator of the Soil Conservation Service, U.S. Department of Agriculture and Mr. Dan Saults, Chief, Office of Conservation Education in the Department of Interior's Bureau of Sport Fisheries and Wildlife.

U.S. Marine Corps winners were the Marine Corps Base at Camp Pendleton, California, which took first place award and, USMCB Camp Lejeune, North Carolina, which achieved second place recognition.

Criteria for the Natural Resources Conservation Award covered such areas as forestry operation, fish and wildlife management, soil and water conservation, pollution abatement programs and other improvement of the quality of the environment. Community relations, conservation education, development of outdoor recreation areas and conservation club activities were also factors that were considered.

A meritorious Achievement citation signed by the Secretary of Defense was given to all Navy and Marine Corps installations nominated for the top conservation award.

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ASNE's involvement with so broad a range of technology puts the society face to face with the growing problem of disseminating technical information. ASNE knows how.

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